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OBSERVATIONS

ON THE

COW-POX.

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By WILLIAM WOODVILLE, M. D.

PHYSICIAN TO THE SMALL-POX AND INOCULATION HOSPITALS.

L O N D O N :

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TO

EDWARD JENNER, M.D. F.R.S. F.L.S. &c.

SIR,

THAT the Vaccine matter, with which the inoculations have been carried on in the Hospital, was contaminated with that of the Variolous, and that a hybrid disease has in consequence been propagated, not only by me, but also by others, who have been supplied with that matter, is a charge which I know to be unfounded, and which it was my duty to refute.

The performance of this task has, however, been very painful to me, from being unable to avoid a certain degree of recrimination, which attaches to a man, for whom I have long entertained a friendly regard, and to whom the public is under the great obligation of having been made acquainted with a discovery which promises the most important benefits to society.

I am,

SIR,

Your obedient Servant,

W. WOODVILLE.

ELY PLACE, July 1st,
1800.

I FEEL myself impelled to address the public a second time on the subject of the inoculation for the Cow-pock, not only because an enlarged experience of it has now enabled me to produce more decisive evidence of its advantages, but because some remarks upon my practice of this new inoculation have lately been made, which call upon me for an immediate reply.

I trust it will be generally acknowledged, that the observations and opinions formerly adduced by me on this subject, are strictly impartial and unprejudiced; also, that the facts on which they are founded, have been

related without the least reserve, and with the most scrupulous fidelity : notwithstanding, my conclusions in respect to a point of considerable importance have been opposed in a manner which I deem wholly unwarrantable. I allude to the pustular eruptions which appeared on more than half the patients first inoculated for the Cow-pock, under my direction ; Dr. Jenner, in a late publication,* having maintained that those pustules could only proceed from variolous matter, introduced by inoculation into the constitution along with that of the vaccine. That objections would be made to this effect might be foreseen, and they were accordingly anticipated in my *Reports*, where several facts and arguments are brought forward to prove, that all the cases which I had represented as cases of Cow-pox, were pro-

* See his continuation of facts and observations relating to the variolæ vaccinæ.

duced from the inoculation of the matter of that disease, uncontaminated with any other. Having done this in a manner which has generally been deemed satisfactory, I did not now expect that any gentleman would publicly attempt to subvert my conclusion without first doing me the justice to show, that the reasons on which it was founded were defective or fallacious. Although I have been disappointed in this expectation, yet as I have no other object in view than a discovery of the truth, I will fully state all the reasons which the ingenious inventor of the new inoculation has advanced in support of a contrary opinion. He first enters upon the consideration of pustules at page 7, where he says, " When I consider the great number of cases
 " of casual inoculation immediately from
 " cows, which have from time to time presented themselves to my observation, and

“ the many similar instances which have been
 “ communicated to me by medical gentlemen
 “ in this neighbourhood: when I consider
 “ too, that the matter with which my inocu-
 “ lations were conducted in the years 1797,
 “ 1798, and 1799, was taken from different
 “ cows, and that in no instance any thing like
 “ a variolous pustule appeared, I cannot feel
 “ disposed to imagine that eruptions, similar
 “ to those described by Dr. Woodville, have
 “ ever been produced by the *pure uncontami-*
 “ *nated Cow-pox virus*: on the contrary, I
 “ do suppose that those which the Doctor
 “ speaks of originated in the action of vario-
 “ lous matter which crept into the constitution
 “ with the vaccine; and this, I presume, hap-
 “ pened from the inoculation of a great num-
 “ ber of the patients with variolous matter,
 “ (some on the third, others on the fifth day)
 “ after the vaccine had been applied; and it
 “ should

“ should be observed, that the matter thus
 “ propagated became the source of future ino-
 “ culations in the hands of many medical
 “ gentlemen, who appeared to have been pre-
 “ viously unacquainted with the nature of the
 “ Cow-pox.”

Were I to allow the above observations all the force which the author of them could reasonably expect, they would still amount to no more than negative proof, and conjectural inference against the evidence of positive facts. It must, however, be remembered, that the Cow-pox, as casually produced by milking infected cows, differs considerably from that which is the effect of a regular inoculation; the local affection in the former case constantly exhibits a deep blue colour, an appearance which the inoculated disease never assumes. The Cows also, according to Dr. Jenner's own statement, readily communicate
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the infection to the persons who milk them, although such persons have undergone the Small-pox.* Dr. Pearson, on the other hand, has informed us, that he made numerous trials to give the vaccine disease, by inoculation, to those who had previously received the Small-pox, but that all his attempts proved ineffectual. Therefore any arguments wholly founded upon the strict analogy between the inoculated and casual Cow-pox, must be considered as inconclusive.

From the manner in which Dr. Jenner has referred to the inoculations conducted by him during the years 1797, 1798, and 1799, the reader may be led to infer, that his experience had been sufficiently extensive to equal mine. But it appears, from his publication in the summer of 1798,† that his practice had not

* Medical and Physical Journal, v. i. p. 213.

† See Dr. Jenner's Continuation of facts, &c. p. 12.

then

then extended to more than eight cases, and no opportunity to inoculate the Cow-pox was offered to him again till he obtained from me matter for the purpose in February 1799. With this matter, which the Doctor now reprobates as the contaminated source of pustules, he inoculated twenty persons, and in a letter to me at that time said, "The rise, progress, and termination of the pustule created by *this virus* on the arm, was exactly that of the true uncontaminated Cow-pox." This *virus*, however, which Dr. Jenner from his own experience declared to be so perfectly pure and genuine, was taken from the arm of an hospital patient, who had 310 pustules, all of which suppurated. On what ground then can he say, "I cannot feel disposed to imagine that eruptions similar to those described by Dr. Woodville, have ever been produced by the pure uncontaminated Cow-pox virus."

As

As a farther evidence of the genuineness of the Cow-pox matter which I sent to Dr. Jenner, I have the testimony of Dr. Marshall, who procured some of it from the persons inoculated by Dr. Jenner, and in the course of five weeks extended its effects in Gloucestershire to 107 persons, all of whom underwent the inoculation in the most favourable manner, nor did any pustules that suppurated appear in a single instance.*

Dr. Jenner, in his last publication, has given a transcript of a great part of Dr. Marshall's letter, in which the above 107 cases are stated; but he does not represent these cases as the effect of the vaccine matter sent by me from the Hospital; on the contrary, he professes to lay Dr. M's communication before his readers, to show the result of the inoculation in particular with the matter which he procured

* Dr. Jenner, l. c. p. 19.

from

from a cow at Mr. Clark's farm, at Kentish Town.*

* The very striking misrepresentation here pointed out must undoubtedly have arisen from some inadvertency, for those who are most acquainted with Dr. Jenner will, I am sure, be the last to suspect that he would willingly disguise the truth to serve any purpose whatever. That I have not here misstated what the Doctor has said will appear from the following paragraph, introductory to the letter above referred to.

"One experiment, tending to elucidate the point under discussion, I had myself an opportunity of instituting. On the supposition of its being possible, that the Cow which ranges over the fertile meadows in the vale of Gloucester, might generate a virus, differing in some respects in its qualities from that produced by the animal artificially pampered for the production of milk for the Metropolis, I procured, during my residence there in the spring, some Cow-pock virus, from a cow at one of the London milk-farms †. It was immediately conveyed into Gloucestershire, to Dr. Marshall, who was then extensively engaged in the inoculation of the Cow-pox; the general result of which, and of the inoculation in particular with this matter, I shall lay before my readers in the following communication from the Doctor." ‡

† It was taken by Mr. Tanner, then a Student at the Veterinary College, from a Cow at Mr. Clark's farm, at Kentish Town.

‡ See Dr. Jenner's Continuation of Facts and Observations relative to the Variolæ vaccinae, p. 11.

Now it is very extraordinary, but certainly a truth, that Dr. Jenner did not even obtain the matter from Clark's cow till after the date of Dr. M's letter, which is said to contain an account of its effects by inoculation. Nor does Dr. Marshall mention the matter received by him from Dr. J. till he had inoculated 423 persons, when in a postscript to the letter, giving a detail of the success of these inoculations, he says, " I should have observed, that
 " of the patients I inoculated, and enumerated
 " in my letter, one hundred and twenty-seven
 " were infected with the matter you sent me
 " from the London cow. I discovered no
 " dissimilarity of symptoms in these cases from
 " those which I inoculated from the matter
 " procured in this county: no pustules oc-
 " curred, except in one or two cases, where
 " a single one appeared on the inoculated
 " arm;

"arm: no difference was apparent in the
 "local inflammation."*

Here the whole of what Dr. Marshall has
 said militates most pointedly against the opi-
 nion of Dr. Jenner, who in the above citation
 is plainly told, that the effects of the matter
 which he conveyed to Dr. M. differed in no
 respect from that which had been employed
 before, and which was sent from the Inocula-
 tion Hospital.

Dr. Jenner has not only given an opinion,
 that the vaccine matter used by me at the
 Hospital was *variolated*, but he has also ven-
 tured to point out how it happened, viz.
 "From the inoculation of a great number of
 "the patients with variolous matter (some on
 "the third, others on the fifth day) after the
 "vaccine had been applied." The opinion
 here given would have had greater influence

* Dr. Jenner, l. c. p. 19.

had the Doctor first condescended to answer the reasons I gave twelve months ago, to shew that it was unfounded: for I can hardly believe that mere conjecture on his part will be thought of sufficient authority to disannul the facts and arguments I had advanced.

Should all that Dr. Jenner contends for be granted, still none of his observations can apply to those patients who had pustules, though inoculated with matter taken immediately from the cow, and to whom no variolous matter was applied during the whole progress of the infection. Instances of this kind the Dr. must have read in my Reports, and must at the same time have known them to be irreconcilable with his opinion. But I have discovered from repeated experience, that if the matter of Cow-pox, and that of Small-pox be inserted in the arm of a patient, even within an inch of each other, so that on the
ninth

ninth day the same efflorescence becomes common to both the local infections, nevertheless, upon inoculating with matter taken from the Cow-pock tumour, the genuine vaccine disease is invariably produced. And I am convinced from experience, that the matter thus taken would not be more liable to produce pustules, or a less favourable disease, than matter procured directly from the cow.

I have already published several other experiments, to shew that the Cow-pox does not *hybridise* with the Small-pox, even when inoculation is performed with the matter of these diseases intimately mixed together in equal quantities. Dr. Jenner must likewise know, that his friend Dr. Marshall has communicated to him the following fact, which corroborates this opinion: "I visited a patient
 " with the confluent Small-pox, and charged
 " a lancet with some of the matter. Two
 " days

“ days afterwards I was desired to inoculate a
 “ woman and four children with the Cow-
 “ pox, and I inadvertently took the vaccine
 “ matter on the same lancet which was before
 “ charged with that of Small-pox. In three
 “ days I discovered the mistake, and fully
 “ expected that my five patients would be
 “ infected with Small-pox; but I was agree-
 “ ably surprised to find the disease to be the
 “ genuine Cow-pox, which proceeded with-
 “ out deviating in any particular from my
 “ former cases.” *

I have now, I presume, said enough to
 convince the reader, that Dr. Jenner's suppo-
 sition is directly incompatible with established
 facts; and I hope in future he will do the
Hospital matter the justice to speak of it as it
 deserves. It has been employed by many
 medical gentlemen, both in London and in

* Dr. Jenner, l. c. p. 20.

the country, and I do not know of one instance in which it has not fully answered the utmost expectations of the inoculator. In making this remark I do not exclude * Dr. Jenner;

* As an additional proof I may appeal to his second publication on the variolæ vaccinæ, where we are informed, that with this matter he inoculated two persons, viz. S. Jenner, three years and a half, and J. Hill, four years old. In the former "case a few red spots appeared, which quickly went off," but Hill had no eruption. From Hill the infection was transferred to 18 persons, on none of whom did it produce any pustules. The red spots which appeared upon S. Jenner were then regarded by the Dr. as an evidence of the genuineness of the vaccine disease, because he had observed similar appearances in the casual Cow-pox. He was therefore led to suppose, that the pustules which the vaccine matter produced in London, was occasioned by some peculiar influence of the town air. Since that time, however, Dr. J. has adopted an opinion, that "the Cow-pox virus assimilates the variolous," and facts, though *stubborn*, must as it often happens, *bend* a little to favour the hypothesis. Thus, in the Dr's last publication, he says, "In a few weeks after the Cow-pox was introduced at the Small-pox Hospital, I was favoured with some virus from this stock. In the first instance it produced a few *pustules*, which did not mature; but in the subsequent cases none appeared." The red spots are here changed into pustules, and appear at *first*, till the variolous poison

Jenner, for in a letter to me the Dr. acknowledges that it had succeeded better than any of the vaccine matter which he had tried before. I beg also to observe, that it had a very strong claim to the Doctor's gratitude; for of the four hundred and twenty-three inoculations brought forward by him to shew the advantages of the vaccine virus as used by Dr. Marshall, two hundred and ninety-six were performed with the matter sent from the Hospital.

Last summer Mr. Abernethy procured at the Hospital some Cow-pock matter, which he transmitted to the Rev. Mr. Holt, Rector of *is assimilated by that of the vaccine.* Again, at page 22, he says, "Some of my correspondents have mentioned the appearance of Small-pox-like eruptions at the *commencement* of their inoculations; but in these cases the matter was derived from the original stock at the Small-pox Hospital."——But "it is the nature of an hypothesis, when once a man has conceived it, that it assimilates every thing to itself as proper nourishment, and from the moment of your begetting it, it generally grows the stronger by every thing you see, hear, or understand."——*Trist. Shandy.*

Finmere,

Finmere, near Buckingham : with this matter the Rector inoculated upwards of three hundred of his parishioners, in all of whom the disease proved mild and tractable. No variolous-like eruptions were produced, except on two persons, who had each one hundred pustules.*

The Rev. Mr. Finch, who was supplied by Mr. Holt with some of this vaccine matter, inoculated 714 persons, on none of whom did any pustules, resembling those of the Small-pox, appear. Now as Dr. Jenner does not believe that variolous-like pustules *have ever been produced by the pure uncontaminated Cow-pock virus*, he is involved in the dilemma of either relinquishing this opinion, or of admitting that the above were not cases of genuine Cow-pox, because in two of Mr. Holt's cases pustules occurred.

* See Medical and Physical Journal, vol. i. p. 401.

Although I differ in opinion from Dr. Jenner in not imputing the pustular eruptions, produced in the cases at the Hospital, to any adulteration of the vaccine matter, employed in the inoculations, yet I readily admit that they have been and still continue to be the effect of some adventitious cause, independent of the Cow-pox.

This will clearly appear, from the following observations, which likewise tend to place the subject in a new light.

I had not long practised the vaccine inoculation at the Hospital, before I was requested to extend it into private families in the Metropolis, where I soon discovered that the Cow-pox uniformly appeared in its mildest form, and was never attended with eruptions. I also supplied several medical gentlemen with the vaccine matter, which was used by them with the like result. Hence I began to suspect
that

that there existed some peculiar cause which rendered the patients under the vaccine inoculation in the Hospital more liable to pustules than others: and that this suspicion was well founded I have since, from daily experience, been fully convinced.

At various times I procured the vaccine virus, as produced in different cows, and with it inoculated patients in the Hospital; but the effects of all the matter I tried were perfectly similar: and pustules proved to be not less frequently the consequence of these trials than of those made with the matter formerly employed.

The last matter of the vaccine poison which I introduced into the Hospital, was obtained from Dr. Jenner, and originally taken from Clark's cow, before noticed: with this matter I inoculated at the Hospital on the same day three patients, on one of whom about 100

variolous-like pustules were produced. This instance, and numerous others of the like kind which I could adduce, decidedly prove, that where there can be no doubt entertained of the purity of the Cow-pock matter, with which the patients in the Hospital are inoculated, pustules will frequently be the consequence.

On the other hand I have to observe, from daily experience during the last twelve months, that among the great numbers of children residing in various parts of London, to whom I have transferred the Cow-pock infection, no instance of pustules that matured has occurred. Now as these different effects of the disease between the patients in, and those out of the Hospital did not depend upon any difference or alteration of the matter with which the inoculations were performed, the only cause remaining to which the frequent occurrence

occurrence of pustules on the former can be rationally referred, is the variolated atmosphere of the Hospital, which those patients were necessarily obliged to inspire during the progress of the Cow-pox infection.

Did it not lead me too much into detail, I should show from many circumstances relating to the patients in the Inoculation Hospital, that other reasons might from thence be adduced to support the opinion here advanced,

Mr. Evans, Surgeon, at Ketley, in Shropshire, is the only person, except myself, who has given an account of the variolous and vaccine inoculations carried on separately in different persons at the same time, and in the same house, so that several of his patients, while under the vaccine infection, were exposed to the variolous effluvia. The number of those which he inoculated for the Cow-pox amounted to sixty-eight; and it is worthy of
remark,

remark, that more than one-half of these patients had pustules.* It is true that the eruptions very rarely matured; but still their frequent occurrence would seem to show they arose from the same cause as those at the Hospital. I suspect also, that in those places where the Small-pox is epidemick, or very generally prevailing, the Cow-pox will be found to be equally liable to excite pustules as in the Hospital.

During the very general and fatal prevalence of the Small-pox at a village eight miles distant from London, more than 100 persons were inoculated under my direction for the Cow-pox, of whom one in five had eruptions; and as these furnish the only instances which I have experienced, out of the Hospital, of the Cow-pox producing the variolous-like pustules,

* Many of Mr. Evan's patients were inoculated with matter sent from Dr. Jenner,

I am disposed to attribute them to the adventitious co-operation of the variolous atmosphere, to which the patients were exposed.† In what way the variolous miasms act in thus modifying the Cow-pox, or why they co-operate in some and not in all cases of vaccine infection, I shall not even venture a conjecture: the causes probably will continue as inexplicable as those constitutional peculiarities which produce all the varieties of Small-pox.

A month had scarcely elapsed after the publication of my Reports on the vaccine disease, before I thought it necessary to inform the public, that the Cow-pock cases at the Hospital had become considerably milder: observing that out of the 310 inoculations, only 39 were attended with pustules, viz. out

† I have lately been favoured with some communications from the country, which tend to confirm this opinion.

of the first 100, nineteen produced pustules; out of the second, 13; and out of the last 110, only seven excited pustules. Since the above statement, which was published in July, 1799, the new inoculation has by me, or under my immediate direction, been extended to about 2000 persons, with none of whom did the infection occasion a severe disorder, or excite one alarming symptom.

In the Hospital, however, the disease still continues to occasionally produce pustules, though not more than in the proportion of three or four cases out of 100. But in my private practice of inoculation for the Cow-pox, which has been very extensive, I have not met with one instance in which any pustules, resembling those of the Small-pox, occurred. Hence the advantages of this inoculation over those of that of the variolous, are (as far as relates to the comparative severity

severity of the disorder which they respectively excite) most satisfactorily evinced.

In order to show that those who had undergone the Cow-pox resisted the infection of the Small-pox, I observed in my *Reports*, that upwards of 400 of the patients who had received the former disease, were afterwards inoculated for the latter, which in no instance was produced; though more than 100 of the patients had the vaccine disease so very slightly, that it neither produced any perceptible indisposition nor pustules. In addition to this, I can now say, that more than 1000 of those who had undergone the new inoculation, have been put to the same test, and that the like result has been experienced.

The above facts, added to a multiplicity of others of a similar import, published by several professional men, clearly demonstrate, that the Cow-pox inoculation promises most impor-

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tant benefits to society ; and under this conviction I congratulate the public on the great progress it is making, by which the real value of the invention will soon become generally acknowledged, and duly appreciated.

It was not to be expected that a disease originating in Brutes should be recommended as a substitute for the Small-pox, and for this purpose be transferred to the human race, without exciting much obloquy and opposition : indeed, several of the most valuable discoveries in medicine, have met with a similar reception ; among these may be included inoculation of the Small-pox, against which the clamour became so considerable, that it fell into disuse for several years. To regulate the disputes which the introduction of that practice into this country occasioned, and to direct the controversy to the true points at issue, Dr. Jurin, then secretary to the Royal Society,

Society,

Society, judiciously stated, that the fate of inoculation depended upon the decision of the two following questions:

First, “ Whether the distemper, given by inoculation, be an effectual security to the patient against his having the Small-pox afterwards in the natural way ?

Secondly, “ Whether the hazard of the inoculation be considerably less than that of the natural Small-pox.”

The application of these remarks to our inquiries into the merits of the vaccine, compared with those of the variolous inoculation, is too obvious to require being pointed out. Now, if by distemper in the first query we understand that of the Cow-pox, and if in the second we add new immediately before inoculation, and substitute inoculated for natural, I would answer both questions in the affirmative, presuming that the facts already brought forward on the subject, clearly decide the

Cow-pock inoculation to be preferable to that of the Small-pox.

An opinion has been propagated, and with several persons has had considerable influence, that the power of resisting the infection of the Small-pox, which the constitution derives from the vaccine disease, will continue only for a few years: but this is mere conjecture, contradicted by facts of casual cases of Cow-pox, and contrary to analogy.

We have abundant evidence to shew, that the Cow-pox and Small-pox are closely allied, and the effects of the former, by preventing the action of the latter, seem to prove that these diseases, are in respect to a very principal point, essentially the same: and as the change which the constitution undergoes from the vaccine disease producing the effect above-mentioned must be similar to that occasioned by the Small-pox, why should it not be equally permanent?

In regard to the comparative mildness of the vaccine and variolous diseases, as produced from inoculation, I have been enabled to give a very different report from that which I published last year. The reason why several of the Cow-pox cases then at the Hospital proved severe, like those of the inoculated Small-pox, has already been sufficiently explained, and will, I trust, have the effect of placing the Cow-pock inoculation in a more advantageous point of view than my former *Reports* presented.

I have before observed, that of the last 2000 cases of Cow-pox under my care, not a single alarming symptom was excited; and I may now add, that during the last eight months I have not met with one instance of the vaccine disease, which has not been as favourable as the mildest cases of variolous inoculation. I have no doubt, therefore, that
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the inoculated Cow-pox is as much milder than the inoculated Small-pox, as the latter disease is milder than the casual Small-pox : nay, it seems to me from the very benign form in which the vaccine pock has of late invariably appeared, that it may be considered as a disease perfectly harmless in its effects.— Indeed, upon this consideration, several persons have been persuaded to have their children inoculated for the disease, although they were very doubtful of the reality of its anti-variolous power. For if it proved a security to the children against the infection of the Small-pox, the object would be attained by the safest means : if it did not, no harm would arise from the experiment, since it was tried merely as a preliminary expedient to the inoculation for the Small-pox. The result, however, has constantly furnished additional evidence in favour of the new inoculation,

and

and of course has tended greatly to promote the adoption of it in London.

Another consideration, highly important to the community is, that as the Cow-pox, unless from the adventitious circumstances before-mentioned, very rarely, if ever, appears with variolous-like pustules, it would seem incapable of propagating itself by effluvia.* Hence by the substitution of the vaccine for the variolous inoculation, the casual spreading of the Small-pox from the inoculated, a circumstance which has greatly contributed to swell the bills of mortality for the metropolis, and of which the public has long justly complained, is completely avoided. Nor is it unreasonable to conclude, that if the new ino-

* A child who had neither undergone the Small-pox nor Cow-pox slept every night in the same bed with its father, mother, and brother, during the whole time the three latter were under inoculation for the Cow-pox: yet the child did not receive the disease till sometime afterwards, in consequence of inoculation.

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culation were to be universally adopted, the variolous disease, in process of time, may be wholly extinguished.

In my former publication on the Cow-pox I subjoined a tabular statement of the cases, in order to shew at one view the result of each ; and it was my intention to continue this table, so as to include all the inoculations that have since been under my direction : but as I now find such a statement could not be comprised in less than one hundred pages, and from what has already been observed would be rendered in a great measure useless, I trust the reader will readily excuse its omission. I shall therefore conclude the subject with some practical remarks.

Those who have had much experience in inoculating with the matter of the vaccine pock, must have observed that it is more apt to fail in communicating the infection than
variolous

variolous matter, especially if it be suffered to dry upon the lancet before it is used. This does not seem to depend upon the virus of the former being more volatile and more easily carried off by evaporation than that of the latter, but from its becoming more hard and less dissoluble upon exsiccation. Care should therefore be taken to moisten it a considerable time before it is used. When fluid matter is employed, the lancet should be held nearly at a right angle with the skin, in order that the infectious fluid may gravitate to the point of the instrument; which in this direction should be made to scratch the cuticle repeatedly, until it reach the true skin, and become tinged with blood. This method has many advantages over the common puncture; and I have found it a more convenient and effectual mode of performing the inoculation than any other. It may be re-

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marked, however, that there are persons who have never had the Small-pox, and are incapable of receiving it by inoculation, or by any other means whatever. The proportion of these to those liable to the disease have been differently stated by authors; I have not found them to be more than about one in sixty; but as such persons also resist the infection of the Cow-pox, the inoculation of the latter must therefore sometimes fail, independently of the mode in which it is performed, or of the matter employed.

When a considerable tumour, and an extensive redness take place at the inoculated part within two or three days after the infectious matter has been applied, the failure of inoculation may be considered as certain, as where neither redness nor tumour is the consequence. This rapid and premature advancement of the inflammation will always be sufficient

sufficient to prevent the inoculator from mistaking such cases for those of efficient inoculation. But there are other circumstances under which I have found the inoculation to be equally ineffectual, and which as being more likely to deceive the inoculator, require his utmost circumspection and discrimination. I here allude to cases in which it happens, that though the local affection does not exhibit much more inflammation than is usual, yet neither vesicle nor pustule supervenes; and in which, about the sixth or seventh day, it rapidly advances into an irregular suppuration, producing a festering, or crustaceous sore. Care, however, should be taken to distinguish this case from that in which the inoculated part assumes a pustular form, though it continue for one or two days only, when the same appearances follow as those above described; for I have experienced the latter inoculation to be as

effectual as where the tumour has proceeded
 in the most regular manner. These obser-
 vations, which I hope will be found useful to
 inoculators, are drawn from a considerable
 number of cases, some of which created in
 my mind much anxiety for the reputation of
 the Cow-pox. For until I had ascertained
 the discriminating circumstances here pointed
 out, I considered every new appearance of
 morbid action, which seemed to take place at
 the inoculated part before the usual period at
 which the disease affects the constitution, as
 suggesting a doubt with respect to the efficacy
 of the inoculation. Hence I sometimes judged
 it necessary to inoculate the same patient a
 second, third, and even a fourth time. Some
 parents, however, were unwilling to subject
 their children to a repetition of the inocula-
 tion, and could not be prevailed upon to com-
 ply without much difficulty, even where their
 refusal

refusal might have been of fatal consequence. I inoculated two children of the same family for the Cow-pox, the younger of whom was 18 months, and the elder four years old. On the fourth day the redness of the local affection in the elder extended to about one-third of an inch or more in diameter, and no vesicle appeared. On the sixth day the redness of the tumour was much increased. On the following day the tumour suppurated and produced a superficial ulcer for two or three days, when the induration and inflammation of the part wholly went off, and the sore healed. In the younger child the progress of the infection was perfectly regular throughout all its stages, and the disease was extremely mild. On the sixth day I told the parents of these children that the elder had not received the Cow-pox, and that a second inoculation would be necessary; at this they appeared

appeared surprized, and observed, that the inoculation had produced more effect upon the elder than the younger child. However, on the ninth day they suffered me to re-inoculate the elder in both arms, when each puncture produced the true vaccine pustule, and the infection proceeded in the most regular manner.

Of mistakes, arising from ineffectual cases of the variolous inoculation, many instances have come under my knowledge, one of which was so very remarkable that I shall relate it here. Not more than two months ago I was desired to attend a boy about five years old affected with the casual Small-pox, of the most confluent kind.

I was informed by the father that his son who was then ill of the Small-pox had been inoculated for this disease three years before by Mr. —, who was a professional man of much experience; but as no pustules were
produced

produced from the inoculation, he requested Mr. — to try the effect of a second inoculation, and this request he earnestly repeated at different times. Mr. — however declined it, and assured him that his child was perfectly secure against the Small-pox. The boy was therefore suffered to play with his sister while she was under inoculation, and from her he received the disease, of which he died. Were the vaccine inoculation to be followed with a similar event, it is highly probable, that without adverting to the cause, it would be brought forward as a proof that the Cow-pox has not the power of preventing the Small-pox; and considering that of late the new inoculation has been very generally practised, I am surprised that evidence against it of this description has not yet been brought before the public.

The time at which the Cow-pox affects the
constitution

constitution after the virus has been applied, appears to be differently stated by inoculators: according to my observations it corresponds nearly to that of the variolous inoculation: however, it not unfrequently happens, that a rash takes place as soon as the local action of the infectious matter becomes evident. The efflorescence at the inoculated part which seldom supervenes before the eighth, or latter than the eleventh day, is to be regarded as an indication that the whole system is affected; and if the patient has not felt any indisposition on or before its approach, he may be assured that there will not be any afterwards. When the efflorescence does not commence till the eleventh day, it is almost always attended with more indisposition than when it occurs on the eighth or ninth day. The efflorescence is more frequent in young infants than to children advanced to three or four years of age,

age, and the former have the efflorescence sooner, and the disease more favourably than the latter, infomuch that by far the greater part of them have no perceptible illness, and require no medicines. On the other hand, in adults, the Cow-pox frequently produces head-ache, pain of the limbs, and other febrile symptoms, for two or three days, which are greatly relieved by a brisk purgative.

After the local tumour has advanced so far as to become a dry scab, a few scattered papulous, or pustular eruptions, sometimes appear: these however are seldom of long continuance, and the pustules rarely suppurate, but when they do, the pus they contain is capable of producing the disease by inoculation. I have inoculated some children for the Cow-pox, whose parents have been desirous that two or three variolous-like pustules, should be produced, which I have generally, though not
 F always,

always, been able to accomplish, by taking a little of the vaccine matter from the inoculated part upon a needle, and with it making a slight puncture in those parts where it was wished the pustules should appear. This should be done about the eighth or ninth day, or when the efflorescence commences. If recent variolous matter be used instead of the vaccine, the effect will be the same. With regard to the appearance of pustules from the vaccine inoculation, I shall extract the following communication by Dr. Pearson, which clearly shews, that Dr. Jenner's opinion upon this subject is contradicted by facts:—"1. In a person
 "inoculated by Dr. Jenner, in the country,
 "who came to town, and was under the care
 "of Mr. Cotton," "the eruptions bore much
 "resemblance to the inoculated Small-pox,
 "in number from twelve to twenty." See Mr. Cotton's letter to Dr. Pearson.—"2. No
 one

“ one has been more active and successful than
 “ Mr. Ring; this gentleman, whose experience
 “ I know has been very extensive, could not
 “ avoid eruptive cases, although he got matter
 “ with great pains, from different sources.” “ I
 “ have,” says Mr. Ring, in his letter to Dr.
 Pearson, “ inoculated thirty patients, with
 “ matter given to me by Mr. Paytherus, and
 “ to him, by Jenner. One of these had about
 “ 150 pustules; these were not distinguishable
 “ from variolous ones, by any diagnostics with
 “ which I am acquainted. The matter was
 “ purulent; became perfectly opaque, and on
 “ exsiccation, formed a scab as large as that
 “ left by the Small-pox.” Was the virus
 used in these cases pure and uncontaminated? *

• A gentleman lately obtained some vaccine matter from the
 Inoculation Hospital, which produced a full eruption of pustules:
 that this was owing to some mistake, I have no doubt, but
 whatever was the cause, I think it right to mention it, as an
 exception to what has been before noticed.